

100 MONKEYS





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100 monkeys typing in unison

To keep under-the-radar, the project's lead researcher, Dr. Jörg Friedrich, typically wasn't invited to scientific conferences or interviewed in the press. Since the monkeys were hooked up to keyboards and touchscreen controllers, Friedrich wanted them to learn the task from doing—or in this case, trying not to do—it themselves.

The team behind another simian keyboard, the Flaming Lips project called Hazer keyboard, had begun that way, trying to build an iPhone-based keyboard for zoo chimpanzees to use.

"My experiments began in the summer of 2013, when I got a call from the researchers at ZooWest in San Diego," Friedrich said in a recent interview with IEEE Spectrum. "They asked me if I'd like to work with a dozen chimpanzees that were going to be trained to type on a screen."

The chimpanzees in question were all part of the Chimpanzee Cognitive Behavioral Lab in Southern California. While their goal was to simply help the chimps with basic literacy—simply using words—Friedrich realized they could do something more interesting with the project, which he has been following closely.

"The idea was to see how the chimpanzees could learn to type from scratch—unlike my monkeys, who had already learned from keyboard experiments," he explained. "They would get the keys, figure out how to move them on the screen, and then be able to type simple commands like 'Play ball!' Or 'Go. To the den.' The idea was to see if you could program basic skills like that."

The team went to the Zoo West to collect the monkeys and start tinkering with the setup. They first placed the monkeys in virtual reality chambers, where they could use the physical buttons on the keyboard, and built a tactile feedback system by providing the monkeys with large foam blocks that would vibrate if they hit the wrong keys.

The touchscreen hardware also involved having two visual screens mounted on a roller. The first screen was the actual keyboard, while the second screen served as a touchpad to enable a mouse-like navigation. In between the two screens, the team created a series of virtual buttons that the apes would eventually learn to press when they pressed the physical keys.

"We did a very detailed simulation of all possible combinations that the monkey would need to know," Friedrich says. "The majority of pressing operations would require two buttons, but some could be

done with one or with three. The UI was very simple, just a keyboard and touchpad.”

After a few weeks, the team had a fully functional monkey keyboard, and observed its new chimp inhabitants using it to type out short sentences and even make typos. Friedrich and his team also began using the keyboard with a variety of other animals, including elephants, great apes, hamsters, and other primates.

“We’ve had great results,” he says. “We are even able to type in noise. When the monkey is close to another chimp in the cage, their typing speeds increase by 2-3x. We get much faster typing with other species. We also see a trend where the training time on each species gets shorter and shorter.”

The monkeys’ keystrokes were being streamed into a large cluster of connected PCs that were running open-source Tcl-based language processing code. That language is being used for many different projects, including an engine for writing longer-form machine-learning systems called TensorFlow, and a way to process documents by quickly estimating the overall context.

Friedrich says the project is almost finished, and hopes to be able to provide a paper about it in the next few months.

Bringing the monkeys’ project online could be useful for studying other cognitive abilities and disorders. Using electronic keyboards, the chimp typing project could give researchers insight into how and when the brain switches from using the tactile screen to manipulating the keyboard. This could be useful for improving dexterity in users with paralysis, for example.

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100 monkeys typing software code

Humans are a dumb animal. Now add back the complexity, and the humans are more likely to beat the software. Make every human do one single thing and test it against itself, and it will rise above anything the smartest rat could possibly achieve. That's why it's possible to make a tiny city in like, three quarters of an inch, because they can focus. It's hard to focus on a long-term goal like building a mammoth skyscraper, because in five years those multi-story units come crashing down, too. And it's important not to think that small is better. Given that the idea of a man building a 10-story skyscraper is much more complex and unlikely than the idea of a single insect building a 1,000-foot building, then let's put the rat on top, but let's make sure that the race has various types of buildings to train their brains in order to conquer the galaxy.

I really love that you put space at the very center of the order of nature, where the different races might compete in different ways, but they all have the fundamental needs of life aligned to them.

Yeah, and it's a great analogy because it really drives home that as our species grows, our interactions are becoming increasingly complex and you have these two antagonists, the robots and the computers, going back and forth trying to kill each other. That's an essential trope of sci-fi: human vs. artificial intelligence. So far, both of them have been wiped out, but now one of them is getting close to being wiped out completely, so this is kind of a moment in human history where we have to choose. Do we allow the expansion of our species in biological terms that can then create an eternal population that will then destroy and bury the other species that live on planet Earth, or should we allow a future when all the humans have been killed and the machines are up-to-speed and controlling it?

If we allow a new version of robotic nature to emerge, what kinds of things would it come up with that might be totally new?

There's always been a quote, so popularized by Buckminster Fuller, that time is real and space is imaginary. And that's been one of the only rules of what constitutes science fiction, especially for long-form books: Does it contain some element of speculation? And especially on this scale—we're talking about hundreds of thousands of years for a movie with hundreds of people dying in it. You have to inject something in order to make it relevant. So my prediction would be that going forward, all the characters of the original *Back to the Future* are going to be mucking around with memory and consciousness and building personality synthesis devices. They're going to go on a sort of major species extinction of biologicals on Earth, like global species extinctions before, just in order to build some trans-human super-race. That, for me, has a real poetic appeal, and it brings up a question: Which species are we really,

when we destroy ourselves and then, what do we build then?

In *The Expanse*, the Mars settlement the three astronauts are trying to buy land from is on the edge of a toxic desert environment. We read in an early scene in your novel, that those folks in the square mill might also be part of an alien civilization to which the locals are largely oblivious. What sort of reasoning—or motivation—would drive such a race to focus on survival?

That sounds like a story that we could all be smarting on, especially in this increasingly fractured global system where it feels like we're all living in an isolated world with no common future. These potential aliens are really out there, and as stories go, there's actually a rational, analytic solution to the problem: Treat each other like equals and work for a common future, and we can work together.

I think part of the beauty of creating another alien species with all the stereotypes of other species on Earth—with humans being cowboys or cowgirls or so on—is that you can have humans flip that on its head, and be like little boys who stand up and fight for those they love. But to me, there are risks in making these black-and-white categories—meaning, any interaction between members of any different group, genetically, can turn an interspecies spark into a match that then ignites the fire.

Let's talk about the Mars Wildfire. You say that a big part of the story is not just this network, but these genetic elements of every species on Earth that's been suffering the blazes: "these regenerative, bio-chemically fueled regeneration bodies are themselves part of a larger ecosystem, and just as not every species can digest the entire ecological impact of global warming, not every species has the strength or healing capacity to recover from damage like a biological wildfire." Is it as simple as this network's natural system being built up and designed to operate this way?

It's pretty much that. Each species has its own bioregion, and there is an eco-system of which the human species is just an adornment, rather than a necessary component. We're just the fire that gets to burn. That's probably a better way of putting it. And then the other thing is, every individual human has absolutely unique genetic makeup, and every species is sort of a system of continuous interaction, and you cannot minimize that completely. Nature doesn't play by unidirectional rules; nature, for as it's both organized and deranged, is constantly rediscovering itself.

All that to say, the Wildfire epidemic was never predicted or seen before; it is a very sudden and kind of fucked-up sort of thing. It's very Earth-sized and very human-like, and the implication—I don't know if this will go into production, because there's not a firm commitment—but the implication of the story is that humans will start creating similar things, using technology, so that we can use these bodies, or these planetary adaptation kits, to simulate this type of epidemic with little extinction in the process.

Can you say more about how this mechanism of simulation works?

These packages of modified individuals appear anywhere that there are humans—not as parasitic microbes, but... you can take 100 copies of yourself and attach them and then give them genetic material and a basic, shared metabolism of Mars wildfire-spreading. Any place you take these copies to, any place where a community is identified as composed of 100 of them, and they take that 100 people and they can look like them or they can behave like them; basically, they can fake this identity.

They can also reproduce inside their host organisms. If a vampire mosquito takes you down and you

share your genetic code, it will reproduce in your body.

Is there some kind of purity to this kind of escape from a true disaster, or is it just a new form of damage?

It's actually a little bit of both. One of the things I enjoy—I think it's a film that's psychologically very up my alley—is that there is no longer a pathway to natural, deep self-knowledge. You're so tuned into this thing that is trying to swallow and consume you, that instead, you're getting a very profound look at the thing that you can't see. And there's a tremendous sense of loss. You feel loss like you've never felt it before.

There's also the energy of this sudden transformation—it's the end of this alien intelligence, like the end of civilization itself. This may not go into production, but there is talk of a possible companion film that would try to dig into that sense of loss. Is this artistic voyeurism in any way appealing?

It's a radical form of art, and I think that's the appeal. As with my own film, the boundaries between nonfiction and narrative film feel enormously thin to me, and I've always gotten very excited about films that bridge those worlds in interesting ways. So yeah, these kinds of hybrids, these little hybrids; it's really thrilling. I like the contour of one medium kissing the other—people who tend not to like it, I don't understand. What's so bad about it?

Are there any other things you've done that are closely associated with humanity's relationship to its own image?

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100 monkeys typing at the same time

One of Carl Zeiss's latest eye-tracking technologies is called Monkey 2. It's essentially a talking calculator: It sits on a desk, and when a researcher points to a number on a computer screen, it translates the input into typing on a computer keyboard.

But it's not your typical brain-zapping, sweat-inducing method of studying the brain and its processing power. There are no big yellow bulbs that wiggle back and forth inside your skull.

The researchers behind Monkey 2 have figured out a much more reliable and cheap alternative. They simply put all the monkeys in the same room with each other. And by placing the monkeys in a room, they've created what's called a neurogenic environment.

"That means that there is the same neural activity between monkeys," explains a brain researcher at the Einstein Autism Research Center in Israel who worked on Monkey 2. "They are doing the same task."

On the other hand, the original monkeys didn't have to share the same brain waves, he explains. They were separated by glass. "We are not using any invasive technique."

So a researcher can stand 10 feet away and see if a monkey is "thinking" the same way. In the past, he says, you would have had to place a mouse in a cage next to the monkey to test brainwave recognition. "But with Monkey 2, we can do it immediately."

This research is important because there are thousands of people who are living with autism, but don't have a diagnosis. Sometimes the symptoms look like normal behavior. The symptoms can be subtle, but even if they're there, it can be hard to diagnose because it's hard to see if something is different about how someone moves their eyes, or their voice, or even their facial expression.

Now the scientific community is starting to figure out how to diagnose people earlier and more effectively. Researchers think these techniques will be a part of that. "Because autism is such a spectrum disorder, there are many different possibilities," says a researcher at the Einstein Autism Research Center in Israel.

And since the technology is so cheap and portable, Dafna thinks it could one day be a cheap screening tool. For example, he thinks people with autism might have trouble reading numbers. If you ask a

monkey to read a number, it's pretty easy. But if you put a few monkeys in a room with three different colored balls, it might take a while to figure out which ball is green. If it was one color, it would be easy. But if it was three colors, it would be harder for all of them. "You see, monkey, monkey," he laughs. "It's true, I'm making a pun."

Yes, this is a silly monkey pun. But it shows how this technology can look at many different things at the same time.

For now, the people studying it are still monkeys.

"We did a study with 6,000 monkeys in 18 countries," says Dafna Shahaf. She's an entrepreneur who works with monkeys. She says it took her five years to figure out how to make it happen.

"Asking a monkey to recognize numbers, that sounds totally easy."

"But it's not as easy as it looks," she says. "And in fact, for the monkey it's really really hard. It took five years to teach the monkeys."

And, you know what? She may have had help. She says this technology was a part of a larger project. She thinks a lot of people helped her with this project. And a lot of people were involved in the design of the monkey that recognizes numbers.

"That was the end of the road," she says. "And now there is a great need for funding to study this on humans."

Monkey Biosciences started as an online company, Shahaf says. She built an algorithm that taught the monkeys to recognize numbers. Now she is testing it on humans, by training people. "The monkeys are learning the right way to read numbers and for humans it's more complicated. We learn by imitation, by watching," she says.

Last year, she says, they trained volunteers to recognize numbers. This year, she's going to train more volunteers.

"We will test the volunteers and then use the results to fine tune the algorithm and improve it and then we will try to translate it to a few thousand humans to test it."

So, a monkey could be the world's first virtual reality soldier. "It's way more interesting than this," he says.

For some people, it might be enough. The monkey will point at a black circle on a screen, and the person in front of him will click a button, and hit a target.

"It's not so easy to build something that human can learn," says Shahaf. "The cost is so high. The equipment is so difficult. So monkey was perfect for me. I could build it myself. I didn't need a million dollars. I don't need a government grant. I don't need a billionaire. I don't need anyone."

There's a lot of money on the line. The potential profits could be huge.

The results of the Monkey Biosciences tests could be a short and shallow ramp. But the company could also be the future of science and more of it. People say that's why they get into science in the first place.

You could see monkey Biosciences as the first step in a long line. If it works, other researchers will be able to train monkeys to do other things.

For example, people have been trying to train monkeys to read faces. "I think that would be an amazing use of these technologies," Shahaf says. "To help read facial expressions of humans, to diagnose diseases."

People have been training monkeys to detect cancer and diagnose illnesses for years. That's partly because monkeys are really smart. They're so much more similar to humans than chimps, and since monkeys are closer in evolution, many scientists think they have a lot more in common with us.

But also because the human brain processes information much more quickly.

This time, we are not teaching the monkeys to recognize numbers. We're training them to see faces.

And when they do, the result is pretty amazing. This is a monkey, equipped with goggles and a VR headset. It's looking at a black and white face, not a person.

And she looks exactly like what she is: a human being.

For the first time, monkeys can actually perceive other people's faces as if they're real.

And they can do this as well as a four year old child.

Recent years have seen huge progress in technology and research, and it's all contributed to the evolution of our species.

And this is just a beginning.

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100 monkeys typing at the same time is pointless

We really need to have humans give us these answers.”

Koprowski went on to explain that in the times of the prophet Muhammad, real technology such as the compass was almost impossible and that they couldn’t even dream of a device such as the GPS.

“This will be the greatest story of the last 1000 years that ever was.”

He explains that now everyone will finally be able to get the peace of mind they seek.

“I haven’t told you this, but I asked that it be kept top secret for now. You’re going to see something very special from my group and it is going to lead the whole world to a very special place. This will be the greatest story of the last 1000 years that ever was.”

He has reportedly made these plans known to his followers. The messages are also known to have been seen by several government officials. This man has been sitting on this information for quite some time, and so for what reason would he want to start leaking it to the general public?

So when is he going to make his big announcement?

Koprowski’s group has made several predictions of their own in the past. In 2025, he said that on a certain date, the whole world would be taken off the grid. A solar storm is expected to take out the planet’s power grid and once this happens, the “carnival” that had been taking place for thousands of years would finally stop.

Hillsong founder Brian Houston warned the world about Doomsday: ‘The end will be marked by the end of our capacity to love’.

This is a very interesting timeline that Christo claims to have come to, but do these alleged plans come to fruition? Is this just a hoax? Only time will tell.

The messages Christo claims that he will be sharing with the world in the coming months should prove very interesting indeed. It may turn out to be nothing more than just an elaborate ruse, but how would

he go about keeping it secret for so long?

Perhaps the mysterious cult leader is just a clever promoter who gets a few people excited for his supposed discoveries, but since Christo's claims have been known to cause mass hysteria, it wouldn't be at all surprising if he does actually lead everyone to a very special place in time.

Do you think Christo is going to achieve his dreams of communicating with aliens, or are the voices he is hearing in his head nothing more than a hoax?

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100 monkeys typing rapidly on standard desktop PC

Forget cockroaches that can write novels and pigeons that can ride bicycles — research scientists have just discovered the world's first 'MacGyver monkey' after it chewed its way out of a computer and hid in a cabinet for three months.

Researchers at the Leiden University Medical Center in the Netherlands noticed that the monkey's owner, Jan van de Rijt, was experiencing technical problems with his computer, so called in scientists.

Using an ultrasound, they were able to determine that the infamous Java worm was targeting Van de Rijt's computer, which had been set up with a DVD drive and wireless internet access.

'Sure, he was dead in a few weeks. But we were certainly happy about having found the monkey,' a researcher said.

'From initial investigation we saw that the door of the computer cabinet was open.

'There was no power on the desk, or any evidence that the monkey had done anything that would have caused the mouse to move or the computer to turn on.'

The object of their scientific desire was hard at work typing furiously as though possessed, using his teeth to pin down the wires and chip out the chips of the keyboard.

There was also a box on the floor that was emptying out thousands of memory cells, keeping him occupied for months.

The lab suspects that the monkey, named Manuel, lost interest in the computer and began living in the cabinet, waiting for his owner to replace the broken equipment.

'When we dismantled the case, the culprit was there waiting for us. The whole thing was very entertaining,' Stojanovic said.

Scientists believe Manuel was probably drawn to the noise produced by the keyboard, and that he experienced withdrawal symptoms and his body.



100 monkeys became the brainchild

of a psychologist at the University of Wisconsin-Madison who wanted to know if behavior could ever be influenced by a word.

Before the project, had you ever been in a room with 100 monkeys?

Very rarely. It's actually only the third time that I've ever been in the presence of 100 monkeys, and the first time I was in the presence of those 100 monkeys, and I wasn't aware of the experiment. It was a wild, unbelievable experience.

I should say, too, that all of them were really quite tame. There was this one young baby monkey, actually, who was cuddled up to me and would have been happy to have been picked up by anybody in the room. But it was like a farm on speed. I couldn't sleep, I was excited about these encounters. This young scientist who was our official monitor was almost like a cardiologist, in the way that she had to calm the monkeys down, keep them together, but also be very kind to them. She had a better understanding of their behavior than I did at that point, and that was a big plus.

What exactly were you testing, and how did you go about doing it?

It was all kind of experimental psychology that I wasn't familiar with, and none of the monkeys had any idea what we were really trying to do.

I worked on the Pygmy marmoset, which is a monkey with a great sense of smell. We'd put perfumed gel inside some coats, and we'd give these coats to them, and their scent was then injected into the little primates, and then they were allowed to walk all around the room. They would be allowed to smell the primate on the other side of the room and of course the primate was supposed to be far away from them.

There were just these random whispers from the monkeys, and they would form little races, and I think the winners of those races sometimes came to the next appointment. I got a feeling for what they were actually doing, and it wasn't just obsessive curiosity, though they certainly showed a lot of that, but it was being able to figure things out, to take advantage of human experience.

So it seems like you were really studying this and then deciding it was also sort of interesting to write a book about it?

It's a story I was doing for a long time before we really began doing the study, which was how is this going to work in a naturalistic way? How could it be mimicked in a naturalistic way? And at a certain point, the animal psychologist showed me a very good-looking book by the ethologist Robert Sapolsky, and it's just fantastic. I think it's the first time you really see the positive relationship between cultural transmission and genetic transmission of behavior in the wild.

It turns out that marmoset and human brains are very similar in many ways. There are only two or three numbers that are really different between humans and marmoset brains, such that it's quite possible that the marmoset brain has facilitated its cultural transmission at the level that human culture has facilitated genetic transmission. So, Sapolsky's book was absolutely mind-blowing, and it occurred to me that if we could identify one of the crossroads for how this genetic transmission of culture actually happens, perhaps we could reverse engineer this and use the crossroads of nature, which is the process of primate's experience of each other, to find the exact process that is happening in humans.

The way that [the monkey] body parts were carefully identified, how that might be something that would never work on a cow or a pig, but was maybe more practical.

I wanted to be a scientist but my parents wanted me to be a teacher. Even though I pursued biology seriously and have always worked with wild animals, I never graduated with any science degrees or anything, so the institution where I earned my masters degree, the University of South Florida, felt it would be appropriate for me to sign up for an additional year in animal husbandry. I did that, and I've been a primate administrator there ever since.

I guess as time goes on I've become more and more interested in anthropology and history and the intersection of science and religion.

Do you miss working with apes more as time goes by?

I don't think I miss having a monkey dress in a little costume every day, because they all look so remarkably natural in their natural states, despite having all of those costumes on. It's fun to have insights into how you might have got from one monkey to another. The results look very homogeneous as a species, but now I realize that you can look at their differences in physical strength, the way they hunt, the way they're social — you know, foraging and befriending one another.

So you know I still have the one here [points to his cage], and he's young, he's still has a lot of energy, and we still do fun behavioral experiments, but at this point I get to look at his face and the stuff that he learns. And we do tests on his ability to retrieve plastic things from a tube. He's very obliging, he has beautiful cooperative skills. He's one of my favorites. But as he gets older we sort of see different things about his personality. The clowns. I love working with the clowns, and they're all super healthy, but I have trouble getting them out. [Laughs]

Everybody asks me: How do you keep them in captivity? And all I can say is — let's count it up: It's the air that I breathe, the food I eat, I've always slept in a bed at night, I've never lost a pet, I've never had cancer. The whole basis for that is that they need to stay in cages. They need to be safe from predators,

they need to stay warm, and everything else is just extra.

I think a lot of people look at a dolphin and they think, “Ooh, that’s such an inspiring life, swimming around in a bunch of different bodies of water.” So, that’s a message I get from watching dolphins and whales, but people can’t fathom that there are chimps and marmosets and magpies. I certainly don’t live a meaningful life. What I get from them is just a good respite from the world that is busy around me. They’re not only fantastic entertainment, but they actually have scientific uses. My job there is not teaching; it’s an administrative job to help get the money for the research that the institute does. But actually, that research has important implications. The study of chimps helped us to learn how to make these gene editing tools that were used in human gene therapy. The things that I get out of working with chimps — I guess my friends back home would say it’s another exercise in being patient, accepting of imperfection, maybe loving my fellow humans — that’s really the best thing we can give them.

And of course they can tell us stuff, like for example, here’s some knowledge we didn’t have before, that chimps are able to assemble parts of a puzzle together to find the mechanism. That stuff is fascinating, it can be used for, in addition to gene therapy, cancer research, brain research. So, it’s an amazingly important tool for every one of us if we can utilize what they’re doing for us.

Can you imagine a world without chimps?

I think the hard question to ask would be: Can we continue to keep them in captivity? I mean, if you asked the people at zoos, I think they’d think, “We want to keep them, so let’s keep them.” So I guess the natural question is: what would that mean for us as a species? And that’s where it gets very controversial. But I think every one of us has a stake in having that discussion and recognizing that a large portion of the human species lives in this amazing natural environment where we have to make a few compromises. And that’s what we’re doing here, and what zoos do.

So it’s a part of the way we live as a species, and I think we’ll be fine with it.



100 monkeys thinking they are in charge

Not what it used to be. What does a morning in the life of a biologist look like?

Probably like this. Some days it is filled with fish, with dolphins, or with turtles. Other days it is filled with jellyfish, or wasps, or bees. Others, it is filled with mosquitoes, or parrots, or deer.

What we do every day is to work on behalf of the reef. It's kind of the same thing as getting a job in the ER, or even an army unit. We are not actually paid for it. No money changes hands.

It is not an activity that a marine biologist normally gets to do on a daily basis. That's not good science. It may be entertaining to see that even primates are brainwashed by the media, but it's a dangerous precedent to set, because in my opinion that makes intelligent people very likely to be susceptible to propaganda, and no one should be that easily brainwashed. Apparently, people are easily manipulated through the knowledge of brainwashing. Many Americans have been indoctrinated through TV and video games to accept anything, regardless of logical reason. I even had some kids tell me that they think everything is a conspiracy theory because it was on TV. Wow!

When the whole town decides that's what they should believe, because they heard it on TV, or because they were told it, that's a dangerous, deadly, ideology. If the truth is not told, it's an easily accessible weapon that can be used against people. What an opportunity for scoundrels to do whatever they want and get away with it.

They are not equipped to be out in the "real world" making decisions. We are told all our lives that our future depends on what we choose to do.

Why is it then that when we become "grown - ups" we choose something so utterly stupid as having a bunch of monkeys thinking they are in charge!

It's time for us to stop being so naive. We now know that nature is cruel and far from perfect. We have seen it all too often. I'm not saying we should become "cowardly". However, we need to be able to take the facts we have and learn to make educated and wise decisions.

Scientists can only study and research all they can. Until we humans can start to govern ourselves, the monkeys will continue to run things. We need to take responsibility for our actions, our homes, our countries and our plane of existence.

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100 monkeys were seated around a screen of some sort

presumably relaying their responses to the recording for a female speaker. When the speaker repeated the word “fire,” 100 of them said it 50 times out of 100.

Many online commentators pointed out that the relatively large number of male responses to the word “fire” was suspicious, particularly when the participants were only given small parts of the audio to convey their own thoughts and feelings. What if the “fire” heard only a few of the times did not represent a genuine desire for the noun itself, but was rather a simpler, more concrete, response such as “I’m afraid?” Another example of the effect can be found in the autistic mind.

The human brain seems to be guided by logical decisions regarding our words and actions, and so when listening to the tapes of the monkeys, it’s difficult to understand exactly what they are thinking and feeling when they are simply repeating the word “fire” in response to a phrase. As noted in an interview with NPR, “it’s hard to know exactly how much the monkeys are relaying emotion and how much is just a literal repetition of the phrase.”

Perhaps there is a message to be learned there – it seems that humans are capable of accurately understanding what a subjective piece of audio says to them, but even a competent writer can fail to convey exactly how we feel from a recording in front of us.

Although the experiment is a long way from revealing a universal form of the mind, there are some key things that this could teach us about what happens within our own heads when we are faced with external stimuli. One of the most revealing examples of this is when we see a person speaking, and we are asked to guess what they’re thinking.

Because people typically think of “thinking” and “contemplating” in the same way – as well as “thinking about” – many psychologists use the phrase “thinking about” as the key aspect of the activity. In the present case, the words “fire” were meaningless and were simply repeated by the monkeys in order to prevent the experiment from running away with itself, and would therefore have been incapable of conveying any emotion or meaning to the participants.

In order to gauge their feelings toward the phrase, participants were asked to say whether the word “fire” was pleasant, not pleasant, or unpleasant to them. Then, in an act that highlights how we view other people’s emotions, they were told to predict the attitudes of the other monkeys, in the same way that the investigators accurately predicted the emotion of the listeners in the earlier experiment.

A total of 55.8% of the participants were able to correctly predict the target monkey’s attitudes toward the recording, which implies that many of them found the clip of the monkey saying the phrase “fire” genuinely interesting. A full 49% of the participants failed to predict any of the monkey’s attitudes, in a counterintuitive result. The more that the participants reflected on the question, the more it was easy to predict a response, and the more confusing the concept of the mirroring was. It’s perhaps surprising that some of the participants themselves actually answered “pleasant” when they were asked what the subject thought.

The problem is that although they recognized that they were seeing a recording of a monkey saying “fire,” they completely failed to understand that they were hearing that the monkey actually wasn’t saying the word “fire.” Instead, it was just repeating the word as an automatic response to the trigger phrase. This means that what we can describe as our responses to the stimuli in the recorded clip are probably an outcome of whatever is running around inside our heads, and not of what we actually do or say. This provides an explanation for how the results of the experiments can be so off-base, and how objective perceptions can easily be distorted – the researchers have not manipulated anything, the subjects have not had any additional information about the recording to go on, and yet their guesses are still based on a bias.

“These findings suggest that, like our attitudes toward the word “fire,” we may be constrained by our own expectations of what the situation means, in order to create meaningful, coherent narratives,” the authors concluded. “Our reaction to an ambiguous signal can be determined by the meanings that we wish to attach to it, and it’s no surprise that these often show up even in seemingly mundane stimuli such as dialogue.”

Of course, the researchers did find some benefits to this kind of “dialogue”: for example, when it came to relating to each other, listeners were better at predicting another’s response than were the other listeners. The answer to whether monkeys actually think in their own language, however, is still open.



100 monkeys and a million monkeys —

100,000 monkeys and a billion monkeys —
what you see is what you get

This time the experiment was different because scientists took blood samples from a lot of the monkeys. These monkeys lived in small cages in the Florida Keys. In fact, so many monkeys lived in such small cages that the name was changed. It became known as the primate island. It was a good name for it because these monkeys were very content. The monkeys are given everything they want and are fed only their favorite food.

It's a banana. Every day the monkeys are also offered a jug of water and two slices of bread. The monkeys like their water sweet, so they often drink from the jug before they consume the bread. The scientists were testing if there was a specific time that the monkeys' craving for sugar changed. In the early morning they eat more sugar because they don't know what time it is. At other times, they eat more sugar when they do know it's time to eat.

That's a great experiment. Then the scientists started playing mind games with the monkeys. They would ring a bell. The monkeys would stand up and wait for the bell to be rung again. They became used to it and stood in their cages all day waiting to be rung. Eventually they learned that the bell was used to get more food. Finally the researchers ring the bell and the monkeys get more food. The experiment shows that it is actually sugar, not lack of food, that causes the craving for sugar.

But what about alcohol? Alcohol stimulates the reward centers in the brain. That's why alcoholics keep drinking. It becomes a reward. The brain makes us crave and get pleasure from it. But, here's the interesting thing. On the second day of drinking, your brain actually becomes less sensitive to alcohol's effects. So on the third day, you feel even less intoxicated than on the first day. But here's the real trick. You feel even less intoxicated because your brain has adapted to the alcohol. It has adapted to it. Your brain is not processing the effects of alcohol as well.

So how do we cope? We don't adapt to stress. We find ways to get away from it. The adrenaline rush of the chase, the fear of the mountain lion, the panic attack in the tube, the rush of relief when you finally make it out alive. That's how we cope. When faced with a challenge, we seek out things that make it easier.

"Just this once", "I'll give it a try". We act on these urges even though we know it isn't sustainable. We

know it isn't good for us. We know we have to face the challenges and do something about it. That's not the same as doing nothing and going with the flow. In a flow, we go with the flow and don't face our demons. We go with the flow and give in to our impulses and impulses lead us down the wrong path.

That's the consequence of not facing the things that scare us. Because there is always a consequence. We aren't meant to go with the flow. We need to face the challenges and choose the right path. We need to make choices and stick to them. Staying in our comfort zone does not lead to success. It leads to a life of mediocrity and unhappiness. But you have the power to create your own destiny. It's up to you to decide what you want.

It's your life. Make it what you want.

Now on to another story about making good choices. This story is about a poor young woman who is raped. She turns to prostitution. She makes the best of her life. She is tough and resilient. She makes choices that are life-changing. She has good instincts. She has a good heart. She has big dreams and is willing to work hard to make them a reality. She believes in herself and in her dreams. She is resourceful and not a victim. She is strong and fearless. In other words, she makes good choices. She makes choices that lead her to her destiny.



100 monkeys play the piano at once

because the humans who released them don't care that they're not safe. But you, you have the courage to help and even ask questions, which is more than I can say for the humans in the control center.

I really wish I could help you but that's not possible. If you come with me, I could set up a way to communicate, if you can get along with me." I don't know if he understands me, but his eyes tell me that he does.

"Are you taking me to another place to be tested?"

"No, I'm taking you to a place where you can learn to communicate with people like me."

He looks confused, so I try to explain again. "Monkeys who are more human than people."

"I see."

I look back and forth between him and the guard.

"I don't have any place else to go.

Can you take me there?"

"I will do my best, but I don't know everything that I'm supposed to do. It's a lot of rules. Can you try to follow them?"

The guard points me back towards the control center.

"If it's not too much trouble," I say, "I need to be able to talk to my friends back at the other lab. I need to make sure they're OK."

"You can't take them there."

"Why not? You said they were fine there."

"I'm sorry, but we don't have anything like that. This is the only place we can take monkeys."

I try to talk him into letting me take Felix back to the other lab. But there's no point. I can't break him out of there.

"OK," I say to the guard.

"I'll go back to my cage, but there's no way I can get back out through there. Can you help me escape?"

He sighs.

"No. You're not going anywhere."

"But if I can't talk to my friends there, what am I supposed to do?"

"I don't know."

"And I need a lot of money to pay you."

"I don't have any money."

"Then you're going to need to go find some. Can you find some?"

"I don't know."

I can try."

"Good. And when you find some, tell the scientist with the money that I need it."

He walks away and we hear the click of the lock on the door. So now I'm trapped in a cage. But at least the monkey in front of me has shown some compassion and is trying to help. I try to keep him entertained, by asking him questions about what's going on.

"How long have you been in here?" I ask.

"Well, you know I'm not a human."

"I know, but do you know why you're here?"

"Not exactly. But I can get back there if I have to."

"Can you?"

"I'm not sure. If the human who brought me here tries to get me back, I'll escape. But for now, I don't think it's worth the risk."

"You don't know that. I bet if you don't have anything to lose, you'd do just about anything to get back

to your friends.”

“I guess you’re right.

I just wish I knew where they were.”

“What about your people? They can’t just let you go.”

“I know, but I don’t know if they can do anything about it.”

“It’s not too late. They’re probably wondering where you are.”

“If they come looking for me, I won’t go. I’ll stay here.”

“No, you don’t have to do that.”

“But I’ve already been here for a week.”

“So? That’s not forever.”

“No, but it’s a long time. How am I going to get back? I don’t know where I am.”

“What’s the easiest way to get out of here?”

“I don’t know.”

“Well, let’s go ask someone.”

He leads me to the cage where the scientists are gathered. They all turn to look at me, but they have the same expression I’m used to seeing on people in the animal cages. So I just sit down in front of them and wait. When the scientists see me, they all scramble away.

“What is this?” the head scientist says.

“This is my new monkey I found him in the laboratory next door.”

“What?” the head scientist says, walking over.

“You stole a monkey? You had no right to do that. It’s our property.”

“I didn’t steal him. I found him He was in a cage there. I just brought him here to show him some compassion.”

The scientist looks at me and starts backing away.

“Get out of here. Get out of here now. We have to report this.”

“Fine. I’ll leave.”

The scientists all run away.

“I hate scientists,” the monkey says, staring after them.

“No, you don’t,” I say.

“Why don’t you want them to leave?”

“They don’t really do anything. They just sit around and watch us.”

“They’re helping you.”

“Yes, but what would you have them do?”

“They could help you find your way back.”

“How?”

I don’t know where I am.”

“No, but maybe if they help you, you’ll know how to get back.”

“I doubt it. I’m not really sure what I am.”

“Okay, but do you want to see some other animals?”

“Sure.” He leads me to the next cage.

“This is a guinea pig,” he says, walking up to the cage.

“I know, but do you know how they got in here?”

“They were brought here by one of the scientists. I think they were in the other cages before.”

“Well, they should be leaving soon. If you ask nicely, I’m sure they’ll let you stay with them.”

“Really?”

“Yes. If you stay with them, you’ll see some other animals.”

“I’m sure they’ll let me stay with them,” the monkey says, smiling.

“I’m sure they will,” I say.

“Okay, good luck.”

“Thank you.”

He walks back to his cage, and I follow him. This time I see the creatures I wanted to see. A mouse, a small pig, a cat, and some kind of bird. They look pretty sad. The mouse looks scared and the pig seems like it has a limp. The bird doesn't look like he can fly. I try to talk to them, but they don't seem to understand. I think they are all lonely. I think they want to go home, too. I've seen enough for one day. I decide to stay with the mice for a while. They seem so content, and they don't seem to care if I talk or not. They seem like they were all alone for a very long time.

When it's time to leave, the mouse looks up at me and says, “You don't have to go yet. I'll keep you company.”

“Okay.”

“Thanks,” he says.

I take my leave. I walk back to the room I was in before, and I take a seat on the grass outside. It feels good to be outside. It's a nice, warm day. The grass is soft beneath my feet. I think about the mice, the birds, and the cat. I decide to get my things and go back to the hotel. I leave the next morning and arrive back in Shanghai at a little after ten o'clock that morning. When I arrive at the hotel, I am disappointed to see that the scientists are not there to welcome me. I am, however, greeted by a man in a white suit.

“I'm going to need your passport.”

“I have my passport,” I say.

“Come with me.”

He leads me to a small room.

“I want you to stay here for a while,” he says, as he takes my passport from me.

“You need to remain here until we can figure out what we want to do with you.”

“I need to call my mother,” I say. “She wants to talk to me. I left her a note.”

“No phone calls. I'm sorry. We are still trying to decide what to do with you.”

He leads me back to my room. I go in and lie down. I am tired. I lie in bed for a long time, feeling incredibly sad. I don't even think about going to the zoo anymore. I've spent enough time there. I want to go home. I don't want to stay here, especially when I know they plan to kill me. I call for a taxi.



One hundred monkeys typing madly on one typewriter

I can do what you do and be better at it. The idiot of the modern age is being reminded that in life bastards can be poets, women can be heroes, a group of ten men can become a town, a rebellious teenager can become a revolutionary hero, and one hundred monkeys typing madly on one typewriter, I can do what you do and be better at it.

The significance of the fifty monkeys, writing their little crazy monkey stuff, is that it does not matter what the world thinks. Who cares what people say and what people do? I just want to know what I am doing and who I am becoming, and then who I might be becoming again. What am I doing where am I going and who am I becoming, when am I reaching this point, or this step?

Can I reach it again and again? Can I be who I am without the thought that the rest of the world will approve? Can I just be me and be who I want to be no matter what anyone says, and when they say it, what is my response? Can I be who I want to be, completely without worry, no matter what anyone else says or thinks? Can I let go of lacking approval? Can I just be? Do not chase approval because there will be no lasting peace. Do not seek approval for you, do not try to make other people happy be proud of your achievements, of your knowledge, of your energy, of who you are.

Do not try to be who you think the world needs you to be, that will only lead you into ignorance. Sometimes it is better to be a loner. Let the ripples spread and create the waves you want to be part of. If they are sweet, they will be where you want to be do not overplay them they need to carry you, do not push them you need them to carry you, and you need to be able to carry them.

Then you will be happy. Spread your consciousness by being part of a group of people who give themselves to help you. Be respectful, be peaceful. Be ready to be the key to unlock the door to another life and another world.

You may die there but what is dying when your life is going on. What happens to the light when the candle is snuffed? You are not a candle, you are the dark the question is, how dark will you let it get in your heart. If it is not dark how dark will you let it get? If it is dark, how will you draw light from within yourself, from others. If it is dark will it feel good to you? If you want to be light you must be dark.

Turn around, and face the darkness. Know that just around the corner the promise is that it will be

night. The truth is that the night is your friend. If it is dark and uncomfortable, it will be the night that will teach you what to do.

You will learn to be fully human in the night. Live in the dark to feel all the cinema of the night. Have a job, do not give yourself a story to tell about you. Lay claim to your destiny, give up the script that you always thought was yours, give up that story of what others want you to be. Lay claim to who you are. Lie to yourself about who you are. Just have faith. Find your path and follow it to the edge of the landscape.

There you will see a row of tools for moving that landscape. Pick them up. They were placed there by your guides, your co-conspirators your colleagues see what you can do, that is your domain. Take your tools in your hand and feel their weight, wiggle their metal into what you want to become, see what you can do.

Without limits you will find what you are really there is no limit. No rules, no limits, just see what you can do. Keep asking questions, maintain your curiosity and trust the stillness within you, others will follow. If they don't find their path, you will find theirs.

Your work in the world of yes is your contribution to the ongoing race to the bottom. If you hold your ground if you keep asking questions and following your curiosity you can do as you wish. You will find no place in which you are not welcome no choice but to ask what would you do if you only had one wish, what would you do if you only had one hair to pluck?

No one will say no to you when you try. Once you are asking someone said he would never step in to save another but that they will save themselves. Others say it is better to ask than to wait for them to think of it. Others say that taking up the slack is a sign of doing your share. Others say, the people who are not capable of acting anyway, need us to do it for them. Others say it is all bullshit, most of it anyway.

Staring at your phone while you sit in a car wreck is a sign of the times, and one of them is that we are missing the point, we need to show the world who we are or they will take us for themselves. The way that we could build such walls is to take out the mystery.

A dark world has no mystery, no wonder, no idea of better, we can think of better and the dark in you says you can't, so shut the fuck up and make them think better for yourself.

Learn how to learn. We tend to put our inability to learn or imagine or learn it into a mountain of reasons to tell ourselves it will never happen to us or never be possible. Our differences are our gifts. We stand in two places at once and need to tell the truth, we are jealous of small things. Learn how to stay awake in the face of darkness. No one knows what it is like to be awake in the face of darkness.

We are supposed to know it when it is just over the horizon. We are not meant to learn it now. But then again, learning anything is good. If you take up the torch you can speak into the darkness while still being aware of your shadow.

There is no sin without it being identified. We know it when we see it. To love you must understand you. Let's see what we can learn together. The answers to those questions will be our collective contri-

butions. The good books are those that treat both subjects as something to be appreciated, pondered, challenged and forgiven for. They tell us to find what you really want to do, what you can do.

Continue to learn how to ask what will you do? see what you can do. Take a page from the top of the ladder and hang your hat there. Keep on climbing. Pity the fool who lives in the shadow but makes it his domain just because it is familiar. It is not. It keeps you in the dark when you must be free.

Why would you allow yourself to be trapped in the dark? Eating anything someone says is a sign of liberation. Consider only yes while you are asking. No-one ever said it would be easy no one ever said that even when it is easy, you shouldn't do it.

Plant your feet on the right path and you will be able to take it when you need it. Gossip is a back door through which to enter with your questions. Keep looking at your own shoes and you can be happy and walk while knowing what your own shoes look like. Accept that your shoes will always look like your shoes.

The most important lesson we can learn.

